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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,973	02/01/2005	Niall Seamus McDonnell	PU020362	6656
24498 7590 07/05/2007 JOSEPH J. LAKS, VICE PRESIDENT THOMSON LICENSING LLC PATENT OPERATIONS PO BOX 5312 PRINCETON, NJ 08543-5312			EXAMINER CHU, GABRIEL L	
			ART UNIT 2114	PAPER NUMBER
			MAIL DATE 07/05/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,973	Applicant(s) MCDONNELL ET AL.	
	Examiner Gabriel L. Chu	Art Unit 2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-8 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-8 is/are rejected.
- 7) ☒ Claim(s) 5 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 6-8 rejected under 35 U.S.C. 102(e) as being anticipated by US**

20030126315 to Tan et al.

3. Referring to claim Referring to claim 6, Tan discloses a storage system including at least one storage device for storing digitized information (Figure 1, storage devices.);

a host system for providing overall control of the media area network (Figure 1, host servers.);

and a host bus adapter for providing a link between the host system and the storage system (Figure 1, host bus adapters.), the method comprising the steps of

monitoring, at a lower-level port driver in the host bus adapter, communication status between the storage system and the host bus adapter (Figure 4, monitor.),

and in the event of failure initiating switching at the lower-level port driver to activate an alternative port, thereby achieving fail-over recovery (Figure 4, failover.

Further, from Tan, "[0044] Another failure that may be detected is the failure of the active controller. This problem is detected by a command timeout combined with a

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failure of a path verification command to the active controller. Detection may also be based on an event notification from the standby controller indicating ICL failure combined with failure of a path verification command to the active controller. The conditions that must be satisfied in one embodiment is that the standby controller is operable and the write cache is synchronized. The failover action in this embodiment is to activate the standby controller and resend all outstanding commands. The event is logged to the host indicating that the controller pair is no longer redundant.” and “[0046] The active path may fail which is detected by a number of methods including a command timeout and path verification command timeout, a target logout from the loop or fabric, and a loop or fabric problem reported by the Fibre manager or Fabric control software. A condition that may be set for this failure is that the standby controller is operable and the write cache is synchronized. The failover actions taken when this condition is found include activating the standby controller, sending previously outstanding and timeout commands, and event notifying the host to indicate the active path failed and path is no longer redundant.”);

queuing requests from an original port that failed for retry on the alternative port; canceling all outstanding requests on the original port; and issuing commands via the alternate port, including commands associated with the requests previously queued for retry (From Tan, “[0044] Another failure that may be detected is the failure of the active controller. This problem is detected by a command timeout combined with a failure of a path verification command to the active controller. Detection may also be based on an event notification from the standby controller indicating ICL failure combined with failure

of a path verification command to the active controller. The conditions that must be satisfied in one embodiment is that the standby controller is operable and the write cache is synchronized. The failover action in this embodiment is to activate the standby controller and resend all outstanding commands. The event is logged to the host indicating that the controller pair is no longer redundant.” and “[0046] The active path may fail which is detected by a number of methods including a command timeout and path verification command timeout, a target logout from the loop or fabric, and a loop or fabric problem reported by the Fibre manager or Fabric control software. A condition that may be set for this failure is that the standby controller is operable and the write cache is synchronized. The failover actions taken when this condition is found include activating the standby controller, sending previously outstanding and timeout commands, and event notifying the host to indicate the active path failed and path is no longer redundant.” Further, see paragraphs 21, 32, and 41, wherein only one controller is active at a time, e.g., it is switched from active, only one is presented at a time, and that the failed controller may even be replaced or rebooted. Inactivating controller thereby cancels pending requests/commands.).

4. Referring to claim 7, Tan discloses the step of monitoring the communication status between the storage system and the host bus adapter further comprises the step of determining whether the storage system successfully completed at least one command (From paragraph 35, “Path verification in monitoring 410 also occurs when command timeouts are received by the failover mechanisms.”).

5. Referring to claim 8, Tan discloses the step of determining whether unsuccessful completion of the at least one command can be corrected by fail-over recovery (Figure 4, elements 430, 440.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1-3 rejected under 35 U.S.C. 103(a) as being unpatentable over US 20030126315 to Tan et al. in view of "real-time" by Microsoft Computer Dictionary (herein MSCD).**

8. Referring to claim 1, Tan discloses a storage system including at least one storage device for storing digitized information (Figure 1, storage devices.);

a host system for providing overall control of the media area network (Figure 1, host servers.);

and a host bus adapter for providing a link between the host system and the storage system (Figure 1, host bus adapters.), the host bus adapter having a lower-level port driver that includes: means for monitoring communications between the storage system and the host bus adapter through an active port (Figure 4, monitor.),

and means for switching to an alternative port, thereby achieving fail-over recovery in the event of a communications failure (Figure 4, failover. Further, from Tan,

"[0044] Another failure that may be detected is the failure of the active controller. This problem is detected by a command timeout combined with a failure of a path verification command to the active controller. Detection may also be based on an event notification from the standby controller indicating ICL failure combined with failure of a path verification command to the active controller. The conditions that must be satisfied in one embodiment is that the standby controller is operable and the write cache is synchronized. The failover action in this embodiment is to activate the standby controller and resend all outstanding commands. The event is logged to the host indicating that the controller pair is no longer redundant." and "[0046] The active path may fail which is detected by a number of methods including a command timeout and path verification command timeout, a target logout from the loop or fabric, and a loop or fabric problem reported by the Fibre manager or Fabric control software. A condition that may be set for this failure is that the standby controller is operable and the write cache is synchronized. The failover actions taken when this condition is found include activating the standby controller, sending previously outstanding and timeout commands, and event notifying the host to indicate the active path failed and path is no longer redundant.");

means for queuing requests from an original port that failed for retry on the alternative port; means for canceling all outstanding requests on the original port; and means for issuing commands via the alternative port, including commands associated with the requests previously queued by said queuing means (From Tan, "[0044] Another failure that may be detected is the failure of the active controller. This problem is

detected by a command timeout combined with a failure of a path verification command to the active controller. Detection may also be based on an event notification from the standby controller indicating ICL failure combined with failure of a path verification command to the active controller. The conditions that must be satisfied in one embodiment is that the standby controller is operable and the write cache is synchronized. The failover action in this embodiment is to activate the standby controller and resend all outstanding commands. The event is logged to the host indicating that the controller pair is no longer redundant.” and “[0046] The active path may fail which is detected by a number of methods including a command timeout and path verification command timeout, a target logout from the loop or fabric, and a loop or fabric problem reported by the Fibre manager or Fabric control software. A condition that may be set for this failure is that the standby controller is operable and the write cache is synchronized. The failover actions taken when this condition is found include activating the standby controller, sending previously outstanding and timeout commands, and event notifying the host to indicate the active path failed and path is no longer redundant.” Further, see paragraphs 21, 32, and 41, wherein only one controller is active at a time, e.g., it is switched from active, only one is presented at a time, and that the failed controller may even be replaced or rebooted. Inactivating controller thereby cancels pending requests/commands.).

Although Tan does not specifically disclose that this failover is performed in real time, real time is well known in the art. An example of this is shown by MSCD, “Of or relating to a time frame imposed by external constraints. Real-time operations are those

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in which the machine's activities match the human perception of time or those in which computer operations proceed at the same rate as a physical or external process." A person of ordinary skill in the art at the time of the invention would have been motivated to use real-time in a failover process because, from MSCD, "a computer must respond to situations as they occur," and further Tan was motivated by speed, from paragraph 8, "Additionally, operating systems often provide hooks for controlling redundancy at improper levels which results in poor error handling and long latencies. Hooks and/or handshaking protocols that are used to allow the host and storage controller to act cooperatively in failover operations are lacking in industry-standard interconnects (such as SCSI-based interconnects, switches, and hubs), and have presently been built into host firmware via the host device drivers, which has further led to problems as each host and each host OS may implement different hooks and protocols. Many OS models dictate that redundancy control come from components that may introduce undesirable delays and interdependencies." Further, Tan appears to operate at speeds sufficient to meet Applicant's desire for "real time", from paragraph 35, "Monitoring 410 may include performing path verification periodically (e.g., path monitoring time interval of about 1 to 10 seconds or more and more preferably, about every 5 seconds) for each target redundant controller. The monitoring 410 by the failover mechanisms preferably includes monitoring all standby paths within the path monitoring time interval to make sure it is available or "safe" to failover when the path is needed. Path verification in monitoring 410 also occurs when command timeouts are received by the failover mechanisms."

9. Referring to claim 2, Tan discloses the monitoring means further comprises means for determining whether the storage system successfully completed at least one command (From paragraph 35, "Path verification in monitoring 410 also occurs when command timeouts are received by the failover mechanisms.").

10. Referring to claim 3, Tan discloses the monitoring means further comprises means for determining whether unsuccessful completion of the at least one command can be corrected by fail-over recovery (Figure 4, elements 430, 440.).

Allowable Subject Matter

11. Claim 5, 11 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form **including all of the limitations of the base claim and any intervening claims**. Referring to claim 11, the prior art does not teach or fairly suggest the step of checking whether cancellation of the outstanding commands occurred, and if not then initiating fail-over recovery of any failed storage system controller.

Response to Arguments

12. Applicant's arguments filed 30 April 2007 have been fully considered but they are not persuasive.

13. Applicant's sole argument appears to be that Applicant is "at a complete loss" as to where or how Tan discloses queuing and/or canceling; that the canceling referred to by Examiner "seems to overlook the idea that the canceling of the present principles is

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performed after we have queued these requests” and that Tan “results in the loss of that information”. Examiner hypothesizes that Applicant appears only to accept that the claims may be interpreted as using reading from the original port the requests queued thereon, requeuing the requests that were read to the alternate port, and subsequent to said reading, canceling the requests on the original port. However, as written, the claims only require that same requests for the original port be queued to the alternate port and canceling the requests on the original port. Tan does this by resending outstanding requests to a standby port (requeuing) and making the standby the active port rather than the formerly active port (thereby canceling requests on the formerly active port). See at least the cited portions.

Furthermore, Applicant appears only to accept that the means/steps may be implemented in the order presented. As written, the claims do not impart any ordering limitation.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gabriel L. Chu whose telephone number is (571) 272-3656. The examiner can normally be reached on weekdays between 8:30 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Gabriel L. Chu
Primary Examiner
Art Unit 2114

gc